

## Multi-kW Uplink Fiber-Laser Beacon with Agile Signal Format, Phase I

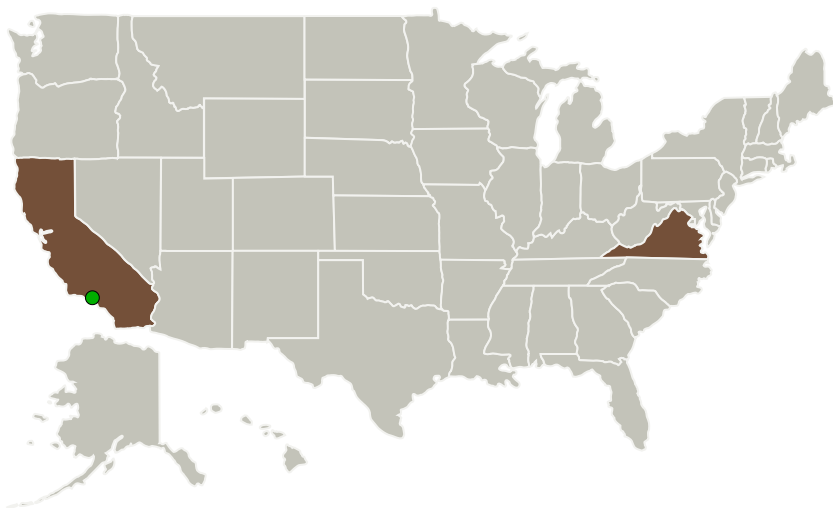
Completed Technology Project (2011 - 2011)




## Project Introduction

Uplink Laser Beacons for deep-space communication, can benefit greatly from migration to the 1010-1030nm wavelengths, via use of Silicon-APDs on the spacecraft receiving terminal. Fibertek has developed an uplink laser transmitter testbed using a multi-stage fiber-MOPA platform, that is also scalable to a multi-aperture architecture. Preliminary demonstration for 1064nm operation has shown multi-kW peak powers using long-pulse slot(>100nsec)based M-ary PPM format. The highly flexible platform developed at Fibertek, also corrects for pulse-shaping, and pulse-train variations, inherent in such multi-kW long-pulse variable-symbol PPM data-format. This SBIR proposal aims to develop and demonstrate the feasibility of a clear technical road map to translate this to shorter wavelengths <1030nm, as well as to further optimize the uplink laser beacon transmitter for representative M-ary PPM data formats, using FPGA based adaptive control.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Fibertek, Inc.	Lead Organization	Industry	Herndon, Virginia
 Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California



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## Primary U.S. Work Locations

California

Virginia

## Project Transitions

 **February 2011:** Project Start

 **September 2011:** Closed out

### Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140182>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Fibertek, Inc.

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

### Principal Investigator:

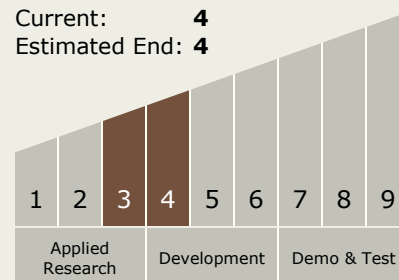
Doruk Engin

## Technology Maturity (TRL)

Start: 3

Current: 4

Estimated End: 4



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## Technology Areas

### Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - └ TX05.1 Optical Communications
    - └ TX05.1.3 Lasers

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System